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EXAMINER

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/518,904
Filing Date: December 23, 2004
Appellant(s): TANABU ET AL.

Michael E. Fogarty
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed December 18, 2007 appealing from the Office action mailed July 18, 2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,744,895	MIYAMOTO et al.	6-2004
2002/0071590	HAN et al.	6-2002

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1, 2, 5, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyamoto et al. (US 6,744,895 B2), hereinafter Miyamoto, in view of Han et al. (US 2002/0071590 A1), hereinafter Han.

Claim 1: Miyamoto discloses a loudspeaker comprising: a hollow frame (case 21) having opening sections at its upper side and lower side; a hat-shaped yoke (pole piece 22) whose both ends are supported by an inner wall of the frame; a ring-shaped first magnet (annular first permanent magnet 23) being coupled with an upper surface of an outer periphery of the yoke; a columnar second magnet (disc shaped second permanent magnet 25) being coupled with an inner bottom of a middle section of the

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yoke; a ring-shaped first plate (annular first top plate 24) being coupled with an upper surface of the first magnet; a plate-type second plate (second top plate 26) being coupled with a lower surface of the second magnet; a first diaphragm (second diaphragm 30) whose outer periphery is fixed to an upper opening of the frame; a second diaphragm (first diaphragm 27) whose outer periphery is fixed to a lower opening of the frame; a ring-shaped first voice coil (annular second voice coil 33) whose one end is fixed to the first diaphragm (second diaphragm 30) and other end is placed at a first magnetic gap (annular second magnetic gap 35) formed between an inner peripheral surface of the first plate (annular first top plate 24) and an outer peripheral surface of the middle section of the yoke (pole piece 22c); and a second voice coil (annular second voice coil 32) whose one end is fixed to the second diaphragm (first diaphragm 27) and other end is placed at a second magnetic gap (annular first magnetic gap 34) formed between an outer peripheral surface of the second plate (second top plate 26) and an inner peripheral surface of the middle section of the yoke (pole piece 22c).

Miyamoto *does not disclose* wherein the frame is integrated with the yoke in assembling the frame, and an upper surface of the yoke is integrated as a reference plane in mounting for a mold of the frame, thereby an interval-accuracy between the first diaphragm and the yoke can be improved as compared with an interval-accuracy between the second diaphragm and the yoke.

Han discloses a magnetic circuit 500 for a micro speaker in which a speaker frame 400 is formed through injection molding to secure the yoke part 100, magnet 200,

and upper plate 300 (Figure 6). Han further discloses wherein an upper surface of the yoke (The upper surface of yoke part 100 which is the opposite side where stepped securing part 130 is located, see Figure 2.) thereof is integrated as a reference plane in mounting for a mold of the frame (See Figure 6. When forming the mold of the integrated frame the magnetic circuit 500 of figure 3, which is upside down in figure 6, is placed in the mold, the upper surface of the yoke 100 which is opposite to the side with stepped securing portion 130 is butted against the surface of the lower die 420, at the protruding section, and used as a reference plane.), thereby an interval-accuracy between the first diaphragm and the yoke can be improved as compared with an interval-accuracy between the second diaphragm and the yoke (Using the upper surface of yoke 100 as a reference plane allows for precise alignment of the magnetic circuit 500 within the coupling means 430. Since the diaphragms as disclosed by Miyamoto attach to the upper and lower portions of a frame, the upper diaphragm that attaches to the upper portion of Han's frame which in turn is connected to the upper surface of yoke 100 which was used as the reference plane, will have better interval-accuracy than the diaphragm attached to the lower portion of Han's frame since its interval-accuracy would depend on the thickness of the yoke and possibly other components like the thickness of the magnet 200 and upper plate 300).

Since the object of Miyamoto's invention is to provide a loudspeaker that will produce sufficient volume without increasing the size of the loudspeaker (Column 1 Lines 65 – 67), it would have been obvious to one of ordinary skill in the art at the time of the invention to secure the magnetic circuit of Miyamoto to the case in a manner

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disclosed by Han since Han's invention allows for a yoke part, a magnet placed upon the yoke part, and an upper plate placed upon the magnet to be coupled to a speaker frame resulting in a slim, firmly connected product without requiring a separate coupling of the components by means of an adhesive (Paragraph 11).

Claim 2: Miyamoto discloses a loudspeaker comprising: a hollow frame (case 21) having opening sections at its upper side and lower side; a hat-shaped yoke (pole piece 22) whose both ends are supported by an inner wall of the frame; a ring-shaped first magnet (annular first permanent magnet 23) being coupled with an upper surface of an outer periphery of the yoke; a columnar second magnet (disc shaped second permanent magnet 25) being coupled with an inner bottom of a middle section of the yoke; a ring-shaped first plate (annular first top plate 24) being coupled with an upper surface of the first magnet; a plate-type second plate (second top plate 26) being coupled with a lower surface of the second magnet; a first diaphragm (second diaphragm 30) whose outer periphery is fixed to an upper opening of the frame; a second diaphragm (first diaphragm 27) whose outer periphery is fixed to a lower opening of the frame; a ring-shaped first voice coil (annular second voice coil 33) whose one end is fixed to the first diaphragm (second diaphragm 30) and other end is placed at a first magnetic gap (annular second magnetic gap 35) formed between an inner peripheral surface of the first plate (annular first top plate 24) and an outer peripheral surface of the middle section of the yoke (pole piece 22c); and a second voice coil (annular second voice coil 32) whose one end is fixed to the second

diaphragm (first diaphragm 27) and other end is placed at a second magnetic gap (annular first magnetic gap 34) formed between an outer peripheral surface of the second plate (second top plate 26) and an inner peripheral surface of the middle section of the yoke (pole piece 22c).

Miyamoto *does not disclose* wherein the frame is integrated with an outer peripheral part of a connected-component which is formed by coupling the yoke with the first magnet and the first plate, and an upper surface of the yoke is integrated as a reference plane in mounting for a mold of the frame, thereby an interval-accuracy between the first diaphragm and the yoke can be improved as compared with an interval-accuracy between the second diaphragm and the yoke.

Han discloses a magnetic circuit 500 for a micro speaker in which a speaker frame 400 (connected-component) is formed through injection molding to secure the yoke part 100, magnet 200, and upper plate 300 (Figure 6). Han further discloses wherein an upper surface of the yoke (The upper surface of yoke part 100 which is the opposite side where stepped securing part 130 is located, see Figure 2.) thereof is integrated as a reference plane in mounting for a mold of the frame (See Figure 6. When forming the mold of the integrated frame the magnetic circuit 500 of figure 3, which is upside down in figure 6, is placed in the mold, the upper surface of the yoke 100 which is opposite to the side with stepped securing portion 130 is butted against the surface of the lower die 420, at the protruding section, and used as a reference plane.), thereby an interval-accuracy between the first diaphragm and the yoke can be improved as compared with an interval-accuracy between the second diaphragm and the yoke

(Using the upper surface of yoke 100 as a reference plane allows for precise alignment of the magnetic circuit 500 within the coupling means 430. Since the diaphragms as disclosed by Miyamoto attach to the upper and lower portions of a frame, the upper diaphragm that attaches to the upper portion of Han's frame which in turn is connected to the upper surface of yoke 100 which was used as the reference plane, will have better interval-accuracy than the diaphragm attached to the lower portion of Han's frame since its interval-accuracy would depend on the thickness of the yoke and possibly other components like the thickness of the magnet 200 and upper plate 300).

Since the object of Miyamoto's invention is to provide a loudspeaker that will produce sufficient volume without increasing the size of the loudspeaker (Column 1 Lines 65 – 67), it would have been obvious to one of ordinary skill in the art at the time of the invention to secure the magnetic circuit of Miyamoto to the case in a manner disclosed by Han since Han's invention allows for a yoke part, a magnet placed upon the yoke part, and an upper plate placed upon the magnet to be coupled to a speaker frame resulting in a slim, firmly connected product without requiring a separate coupling of the components by means of an adhesive (Paragraph 11).

Claim 5: Miyamoto discloses a loudspeaker comprising: a hollow frame (case 21) having opening sections at its upper side and lower side; a hat-shaped yoke (pole piece 22) whose both ends are supported by an inner wall of the frame; a ring-shaped first magnet (annular first permanent magnet 23) being coupled with an upper surface of an outer periphery of the yoke; a columnar second magnet (disc shaped second

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permanent magnet 25) being coupled with an inner bottom of a middle section of the yoke; a ring-shaped first plate (annular first top plate 24) being coupled with an upper surface of the first magnet; a plate-type second plate (second top plate 26) being coupled with a lower surface of the second magnet; a first diaphragm (second diaphragm 30) whose outer periphery is fixed to an upper opening of the frame; a second diaphragm (first diaphragm 27) whose outer periphery is fixed to a lower opening of the frame; a ring-shaped first voice coil (annular second voice coil 33) whose one end is fixed to the first diaphragm (second diaphragm 30) and other end is placed at a first magnetic gap (annular second magnetic gap 35) formed between an inner peripheral surface of the first plate (annular first top plate 24) and an outer peripheral surface of the middle section of the yoke (pole piece 22c); and a second voice coil (annular second voice coil 32) whose one end is fixed to the second diaphragm (first diaphragm 27) and other end is placed at a second magnetic gap (annular first magnetic gap 34) formed between an outer peripheral surface of the second plate (second top plate 26) and an inner peripheral surface of the middle section of the yoke (pole piece 22c).

Miyamoto does not disclose wherein the frame is integrated with the yoke in assembling the frame, a lower surface of the yoke is integrated as a reference plane in mounting for a mold of the frame, thereby an interval-accuracy between the second diaphragm and the yoke can be improved as compared with an interval-accuracy between the first diaphragm and the yoke.

Han discloses a magnetic circuit 500 for a micro speaker in which a speaker frame 400 is formed through injection molding to secure the yoke part 100, magnet 200, and upper plate 300 (Figure 6). Han further discloses wherein a lower surface of the yoke (The lower surface of yoke part 100 which is also the side where stepped securing part 130 is located, see Figure 2.) thereof is integrated as a reference plane in mounting for a mold of the frame (See Figure 6. When forming the mold of the integrated frame the magnetic circuit 500 of figure 3, which is upside down in figure 6, is placed in the mold, the lower surface of the yoke 100 which is the side with stepped securing portion 130 is butted against the surface of upper die 410 and used as a reference plane.), thereby an interval-accuracy between the second diaphragm and the yoke can be improved as compared with an interval-accuracy between the first diaphragm and the yoke (Using the lower surface of yoke 100 as a reference plane allows for precise alignment of the magnetic circuit 500 within the coupling means 430. Since the diaphragms as disclosed by Miyamoto attach to the upper and lower portions of a frame, the lower diaphragm that attaches to the lower portion of Han's frame which in turn is connected to the lower surface of yoke 100 which was used as the reference plane, will have better interval-accuracy than the diaphragm attached to the upper portion of Han's frame since its interval-accuracy would depend on the thickness of the yoke and possibly other components like the thickness of the magnet 200 and upper plate 300).

Since the object of Miyamoto's invention is to provide a loudspeaker that will produce sufficient volume without increasing the size of the loudspeaker (Column 1

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Lines 65 – 67), it would have been obvious to one of ordinary skill in the art at the time of the invention to secure the magnetic circuit of Miyamoto to the case in a manner disclosed by Han since Han's invention allows for a yoke part, a magnet placed upon the yoke part, and an upper plate placed upon the magnet to be coupled to a speaker frame resulting in a slim, firmly connected product without requiring a separate coupling of the components by means of an adhesive (Paragraph 11).

Claim 6: Miyamoto discloses a loudspeaker comprising: a hollow frame (case 21) having opening sections at its upper side and lower side; a hat-shaped yoke (pole piece 22) whose both ends are supported by an inner wall of the frame; a ring-shaped first magnet (annular first permanent magnet 23) being coupled with an upper surface of an outer periphery of the yoke; a columnar second magnet (disc shaped second permanent magnet 25) being coupled with an inner bottom of a middle section of the yoke; a ring-shaped first plate (annular first top plate 24) being coupled with an upper surface of the first magnet; a plate-type second plate (second top plate 26) being coupled with a lower surface of the second magnet; a first diaphragm (second diaphragm 30) whose outer periphery is fixed to an upper opening of the frame; a second diaphragm (first diaphragm 27) whose outer periphery is fixed to a lower opening of the frame; a ring-shaped first voice coil (annular second voice coil 33) whose one end is fixed to the first diaphragm (second diaphragm 30) and other end is placed at a first magnetic gap (annular second magnetic gap 35) formed between an inner peripheral surface of the first plate (annular first top plate 24) and an outer

peripheral surface of the middle section of the yoke (pole piece 22c); and a second voice coil (annular second voice coil 32) whose one end is fixed to the second diaphragm (first diaphragm 27) and other end is placed at a second magnetic gap (annular first magnetic gap 34) formed between an outer peripheral surface of the second plate (second top plate 26) and an inner peripheral surface of the middle section of the yoke (pole piece 22c).

Miyamoto *does not disclose* wherein the frame is integrated with an outer peripheral part of a connected-component which is formed by coupling the yoke with the first magnet and the first plate, and a lower surface of the yoke is integrated as a reference plane in mounting for a mold of the frame, thereby an interval-accuracy between the second diaphragm and the yoke can be improved as compared with an interval-accuracy between the first diaphragm and the yoke.

Han discloses a magnetic circuit 500 for a micro speaker in which a speaker frame 400 (connected-component) is formed through injection molding to secure the yoke part 100, magnet 200, and upper plate 300 (Figure 6). Han further discloses wherein a lower surface of the yoke (The lower surface of yoke part 100 which is also the side where stepped securing part 130 is located, see Figure 2.) thereof is integrated as a reference plane in mounting for a mold of the frame (See Figure 6. When forming the mold of the integrated frame the magnetic circuit 500 of figure 3, which is upside down in figure 6, is placed in the mold, the lower surface of the yoke 100 which is the side with stepped securing portion 130 is butted against the surface of upper die 410 and used as a reference plane.), thereby an interval-accuracy between the second

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diaphragm and the yoke can be improved as compared with an interval-accuracy between the first diaphragm and the yoke (Using the lower surface of yoke 100 as a reference plane allows for precise alignment of the magnetic circuit 500 within the coupling means 430. Since the diaphragms as disclosed by Miyamoto attach to the upper and lower portions of a frame, the lower diaphragm that attaches to the lower portion of Han's frame which in turn is connected to the lower surface of yoke 100 which was used as the reference plane, will have better interval-accuracy than the diaphragm attached to the upper portion of Han's frame since its interval-accuracy would depend on the thickness of the yoke and possibly other components like the thickness of the magnet 200 and upper plate 300).

Since the object of Miyamoto's invention is to provide a loudspeaker that will produce sufficient volume without increasing the size of the loudspeaker (Column 1 Lines 65 – 67), it would have been obvious to one of ordinary skill in the art at the time of the invention to secure the magnetic circuit of Miyamoto to the case in a manner disclosed by Han since Han's invention allows for a yoke part, a magnet placed upon the yoke part, and an upper plate placed upon the magnet to be coupled to a speaker frame resulting in a slim, firmly connected product without requiring a separate coupling of the components by means of an adhesive (Paragraph 11).

(10) Response to Argument

Applicant's arguments with respect to claims 1, 2, 5, and 6 have been fully considered but they are not persuasive.

Applicant begins their argument on page 9. Paragraph 1 starts by incorrectly stating "It is respectfully submitted that none of the cited prior art, alone or in combination, disclose or suggest the limitations of claims 1, 2, 5 and 6 of a loudspeaker wherein the frame is integrated with the yoke in assembling the frame (claims 1 and 5) or the frame is integrated with an outer peripheral part of a connected-component which is formed by coupling the yoke with the first magnet and the first plate (claims 2 and 6), and wherein either an upper surface (claims 1 and 2) or a lower surface (claims 5 and 6) of the yoke is integrated as a reference plane in mounting for a mold of the frame."

As presented in the rejection of claims 1, 2, 5, and 6, Han discloses a magnetic circuit 500 for a micro speaker in which a speaker frame 400 is formed through injection molding to secure the yoke part 100, magnet 200, and upper plate 300 (Therefore, "the frame is integrated with the yoke" as required by claims 1 and 5 and also "the frame is integrated with an outer peripheral part of a connected-component which is formed by coupling the yoke with the first magnet and the first plate" as required by claims 2 and 6, see Figure 6). Han further discloses wherein an upper surface of the yoke (The upper surface of yoke part 100 which is the opposite side where stepped securing part 130 is located, see Figure 2.) thereof is integrated as a reference plane in mounting for a mold of the frame (See Figure 6. When forming the mold of the integrated frame the magnetic circuit 500 of figure 3, which is upside down

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in figure 6, is placed in the mold, the upper surface of the yoke 100 which is opposite to the side with stepped securing portion 130 is butted against the surface of the lower die 420, at the protruding section, and used as a reference plane (claims 1 and 2) also the lower surface of the yoke 100 which is the side with stepped securing portion 130 is butted against the surface of upper die 410 and used as a reference plane (claims 5 and 6).

Applicant then states "as a result of the foregoing structure, an interval-accuracy between the first (claims 1 and 2) or second (claims 5 and 6) diaphragm and the yoke can be improved as compared with an interval-accuracy between the second or first diaphragm and the yoke."

Therefore, since improved interval-accuracy is a result of the "foregoing structure" as admitted by Applicant, and Han disclosed the "foregoing" structure", Applicant's arguments that follow in paragraphs 2 – 6 regarding the positional relationship between the structure and the diaphragm are moot. However, to be complete the Examiner will also address the argument's regarding the positional relationship of the diaphragm.

To continue, in paragraph 2 Applicant correctly states that "It appears that nowhere in the Han reference is there any mention of a diaphragm. Han merely discloses that injection molding "unitizingly secures the yoke part, the magnet and the upper plate" (see, Abstract of Han).", the citation provided by Applicant again confirms that Han discloses the "forgoing structure" previously mentioned. The Applicant then states "As such, without mentioning a diaphragm, there can be no indication of an

improvement in the interval-accuracy of one diaphragm and the yoke over that of another. Accordingly, there is no suggestion or motivation in terms of improving interval-accuracy, as suggested in claims 1, 2, 5 and 6.”

However, Applicant fails to realize that Miyamoto does disclose the positional relationship of the diaphragms to the frame (diaphragms attach to upper and lower surface of frame, Figure 1 of Miyamoto) and that the combination of Miyamoto and Han is simply a replacement of Miyamoto’s frame (case 21, see Figure 1) with that of Han’s frame (frame 400, see Figure 3). Therefore, one of ordinary skill in the art would recognize that after the replacement of Miyamoto’s frame with Han’s frame, the diaphragms of Miyamoto would still connect to the upper and lower surfaces of the frame.

Further, suggestion or motivation in terms of improving interval-accuracy is not necessary since the reason for combining the references is for a different reason. As presented in the rejection of claims 1, 2, 5, and 6 “since the object of Miyamoto’s invention is to provide a loudspeaker that will produce sufficient volume without increasing the size of the loudspeaker (Column 1 Lines 65 – 67), it would have been obvious to one of ordinary skill in the art at the time of the invention to secure the magnetic circuit of Miyamoto to the case in a manner disclosed by Han since Han’s invention allows for a yoke part, a magnet placed upon the yoke part, and an upper plate placed upon the magnet to be coupled to a speaker frame resulting in a slim, firmly connected product without requiring a separate coupling of the components by means of an adhesive (Paragraph 11)”.

In paragraph 3, found at the beginning of page 10, Applicants states "the Examiner has not provided the requisite evidence to support this allegation," the allegation being that the interval-accuracy is a direct result of the combination of both references. However, the Examiner has relied on the resulting structure of the combination of Miyamoto and Han as being the substantially identical and therefore the improvement in interval-accuracy is presumed to be inherent unless Applicant discloses that the combined structure would not be substantially identical. It is noted that Applicant never provided such evidence showing that the combination would not be identical, and in fact Applicant has now supported the Examiner by stating that improved interval-accuracy is a result of the "foregoing structure" as discussed previously as being disclosed by Han.

Finally, in paragraph 4 Applicant states "As such, the speaker case 21 is being held separately from that of the pole piece (yoke). As such, even if the insert molding of Han were applied to Miyamoto, the combination would still not suggest that the case 21 is integrated with the yoke 22 using insert molding." The Examiner acknowledges that case 21 is separate from that of the yoke in the Miyamoto reference, hence the combination with Han, using the frame 400 of Han in place of case 21 of Miyamoto. As cited previously by Applicant injection molding as taught by Han "unitizingly secures the yoke part, the magnet and the upper plate" (see, Abstract of Han)" and therefore Han teaches "integrating" the frame and the yoke.

To conclude the Examiner would like to draw attention to Applicant's disclosed prior art speaker in Figure 4 with that of Miyamoto's speaker of Figure 1 and Applicant's

frame 1D of figure 3 with that of Han's frame 400 in Figure 3 while reasserting the argument above in a summarized form as previously presented to Applicant in the Final Office Action dated July 18, 2007. "The examiner agrees that Han is only concerned with the improvement of a speaker frame that allows for an injection molded frame to secure the yoke part, the magnet, and the upper plate without requiring adhesive (Paragraph 11). The examiner also notes that these are the same components that attach to the frame of Miyamoto. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the frame of Han in place of the frame of Miyamoto thereby enhancing the speaker of Miyamoto do to Han's frame not needing adhesive. Although the advantage of an interval-accuracy between the one diaphragm as compared to the other being improved is not taught by either reference, it would be a direct result of the combination of both references; since due to the way Han's frame is molded, the diaphragm connected to the frame on the same side as the reference plane for the yoke would have better accuracy than the other side. Therefore while the references are combined for reasons other than improving the interval accuracy, the improvement to the interval accuracy between one side over the other still occurs."

Therefore, the Examiner respectfully submits that the combination of Miyamoto and Han disclose all of the claimed limitations required of claims 1, 2, 5, and 6.

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(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/J. S./

Examiner, Art Unit 2615

March 10, 2008

Conferees:

/Sinh N Tran/

Supervisory Patent Examiner, Art Unit 2615

/Vivian Chin/

Supervisory Patent Examiner, Art Unit 2615